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I. EXECUTIVE SUMMARY

This report describes the program “Children’s Oral Healthcare Access Program” and the activities undertaken by the South Carolina, Department of Health and Environmental Control, Division of Oral Health, with funding from the Health and Resources Services Administration (HRSA) and grant number H47MC29817. This program was part of a broader national effort referred to as the Perinatal and Infant Oral Health Quality Improvement (PIOHQI) program.

Despite recent improvements in the oral health of South Carolinians, oral health and access to oral health care remains a significant challenge for SC children and adults, particularly in rural areas of the state. To address this issue, the SC PIOHQI program aimed to (1) increase the oral health messages delivered to pregnant women and infants, (2) improve state- and systems-level policies or practices, and (3) improve access to and utilization of preventive oral health care. Eight SC counties were targeted to receive the SC PIOHQI program; these counties were located within the four SC DHEC regions and were selected because of the challenges that they face in making oral health care accessible and delivering oral health care messages to their residents. Over the grant period, the SC DOH team worked at multiple levels and across different settings to develop the tools, materials, and means to improve preventive oral health care for pregnant women and infants in these counties.

Leveraging the knowledge, experience, and support of multiple bodies – the Project Advisory Board (PAB), the PIOHQI National Learning Network (NLN), and the state’s Regional system, the SC PIOHQI team undertook activities in multiple arenas: (1) education and training in preventive oral health care for pregnant women and mothers, (2) formal professional training, including the granting of CEs, (3) quality improvement, (4) learning lab development, (5) regional training sessions with Community System Development staff in the delivery of oral health messages, (6) regional network capacity building and mapping, and (7) policy innovations and change to spur broader systems change in oral health care. The project was unique for its multifold and multilevel (state and region) approach, but also its systems thinking and the need to identify and map the network structure that underlies the statewide and regional oral health care system.

The SC PIOHQI project celebrated a number of key successes during the grant period. These include (1) the implementation of policy and procedural guidelines on the application of fluoride varnish to children in both the WIC and Medicaid settings; (2) the development of strong regional teams that understand and are able to train local community groups on the oral health care for pregnant women and children; (3) the creation of training materials and resources for medical and dental providers that are readily available on the state’s Connecting Smiles website; (4) the fostering of learning labs and quality improvement processes with local health clinics and home visitation programs; and (5) the development of more robust surveillance mechanisms that include measures of oral health across different data systems and monitor the oral health network itself.

Yet, the lack of dental providers in rural SC will continue to pose challenges for women’s and infants’ access to preventive oral health care.
II. BACKGROUND

A. Rationale
Dental care is one of the most prevalent unmet health needs in children in the United States with a wide range of disparities existing in oral health and access to care. In addition to studies identifying the association of maternal oral health status with Early Childhood Caries experience in infants, numerous studies suggest the possibility that maternal periodontal disease is associated with preterm birth and delivery of a small gestational age baby. Therefore, South Carolina had an obligation to define and address the needs and barriers to access oral health for pregnant women and infants most at risk for dental diseases and conditions. The 2011-2013 SC Pregnancy Risk Assessment Management System (PRAMS) data indicated 202,000 reported pregnancies in SC, with estimates suggesting that 46.2% of the women in South Carolina receive no dental care when pregnant.

Among children eligible for Medicaid or the State Children’s Health Insurance Program (SCHIP), the lack of dental provision or oral health care was more pronounced. Only 27.5% of the estimated 186,000 children aged 0-3 years eligible for Medicaid or SCHIP received some type of dental services. The costs of these dental services roughly totaled $10.4 million spent. Yet, the costs of such preventive services are on average 10x less than the costs of treatment or diagnostic services. Compounding the general lack of knowledge on the importance of perinatal and infant oral health is the lack of dental providers in rural areas of SC. There are some SC counties with no or only limited access to dental providers within reasonable driving distances. Addressing the oral health of pregnant women and infants thus required the Division of Oral Health (DOH) within the SC Department of Health and Environmental Control (DHEC) to take a systems-level approach with activities designed to integrate change at multiple levels.

B. Program Strategies and Aims
1. **Strategy 1: Increase oral health messages delivered to pregnant women and infants.**
   1. **Aim A.1:** By August 2017, each state team will partner with at least one program impacting pregnant women such as WIC, Healthy Start, or home visiting program, with broad geographic reach that will incorporate targeted oral health messages into routine business activities.
   2. **Aim A.2:** By August 2017, each state team will partner with at least one program impacting infants, such as WIC, Early Head Start, Healthy Start, or home visiting program, with broad geographic reach that will incorporate targeted oral health messages into routine business activities.

2. **Strategy 2: Improve state- or systems-level policies and practices.**
   1. **Aim B.1:** By August 2017, each state team will develop, adopt, or improve operationalization of at least one pregnant woman-centered policy and/or practice at the state, clinical system, health plan, or dental or dental hygiene school curriculum level that helps to improve access to or quality of oral health care for those populations.
   2. **Aim B.2:** By August 2017, each state team will develop, adopt, or improve operationalization of at least one infant-centered policy and/or practice at the state, clinical system, health plan, or dental or dental hygiene school curriculum level that helps to improve access to or quality of oral health care for those populations.

1. **Aim C1:** By August 2017, increase by 10% over baseline the percent of oral health providers in selected SC counties which provide services to pregnant women.

2. **Aim C2:** By August 2017, increase by 10% over baseline the percent of obstetrics/gynecology providers in selected SC counties who perform oral health assessments for pregnant women.

3. **Aim C3:** By August 2017, increase by 10% over baseline the percent of primary care medical providers who serve infants < 1 year in selected SC counties that provide oral health services.

C. County Selection

South Carolina consists of 46 counties divided into 4 Public Health Regions. As shown in Map 1, two counties within each region were identified as high need based on multiple criteria. The selection criteria used to formulate a final county score included overall birthrate, Medicaid-eligible birthrate, infant mortality, HPSA (Health Professions Shortage Area) designation priority scoring, statewide Emergency Department (ED) dental utilization, annual child visits to a dentist, access to Federally Qualified Health Centers (FQHC), dental workforce accepting Medicaid reimbursement, availability and types of school clinics, and fluoride utilization. The final scores of the 46 counties ranged from 37 to 69.

Using these formulations, the program targeted 8 counties in 4 regions (scores in parentheses):

1. **Lowcountry** (Yellow Counties): Bamberg (53) and Orangeburg (66)

2. **Midlands** (Red Counties): Fairfield (54) and Richland (52)

3. **Pee Dee** (Blue Counties): Darlington (69) and Lee (52)

4. **Upstate** (Green Counties): Greenwood (44) and McCormick (57)

III. PROGRESS

A. Project Advisory Board

The Project Advisory Board should consist of appropriate community-level personnel and key individuals who can provide subject matter expertise, including medical and dental providers; community health agents; and experts on state Medicaid policies, data, and quality improvement. The Advisory Board was expected to: provide advice and oversight regarding program direction, participate in discussions related to allocation and management of project resources, and share responsibility for the identification and maximization of resources and community ownership to sustain project services beyond the project period of Federal funding.

The Project Advisory Board (PAB) was established for the PIOHQI project in 2016 with 12 Board members. Tables 1-2 provides the number of PAB members and the number of PAB meetings within each grant year. The PAB consisted of key stakeholders in the area in the health field across the state, including
the SC Primary Health Care Association, the DHEC OB taskforce and Pediatric Advisory Committee, the South Carolina Oral Health Coalition (SCOHC), an OB specialist, and the Dean Emeritus of the James B. Edwards College of Dental Medicine at the Medical University of South Carolina (MUSC).

B. Accomplishments

Engaging the PAB led to a number of key accomplishments over the grant period. One key contribution of the PAB in the first year of the PIOHQI grant period was the PAB’s advisement and recommendations of the perinatal oral health guidelines. The PAB agreed with the DOH’s recommendation to include the national consensus statement on oral health during pregnancy and supplement it with state level statistics and resources.

Other accomplishments and highlights of the PAB during the PIOHQI grant period were:

- The PAB provided feedback on the dissemination plan for the *Oral Health for Pregnant Women* guidelines.
- The PAB reviewed the Learning Lab process maps and engaged in developing a sustainability plan for PIOHQI activities and future DOH projects.
- One PAB member revised the syllabus of her introductory class for dental students to include the *Oral Health for Pregnant Women* guidelines, with students required to read the guidelines. This implied the dissemination of the guidelines to 70 first-year dental students at South Carolina’s only School of Dentistry.
- Two PAB members, the Vice-President of the South Carolina Primary Health Care Association (SCPHCA) and the Executive Director of the SC Dental Association, committed their organization’s resources to partner with PIOHQI on training providers.
- One PAB member presented on “Expansion of Integration of Oral Health in A Physician’s Office” at the annual CATCH meeting, a statewide meeting sponsored by the South Carolina Chapter of the American Academy of Pediatrics (SCAAP) that engages over 150 pediatric offices across the state as well as public and private entities that interact with families of children 0-3.
- One PAB member conducted a learning session for a select group of pediatric offices that are part of the Quality through Technology in Pediatrics (QTIP) initiative. These offices are encouraged and incentivized to work on addressing health topics, including oral. Participants attending the training were certified on site to apply fluoride varnish. His presentation, “Integrating Oral Health into Primary Care,” was shared along with PIOHQI project resources.
- Members of the PAB completed the Frameshift Group – Program Sustainability Assessment Tool – to assess the state team’s preparedness for sustainability. The team had an overall average of 5.2 out of 7, with the lowest rating in the area of funding stability and strategic planning.

C. Participation in the COHSII led activities
The PIOHQI National Learning Network (NLN) provided the opportunity peer-to-peer learning in collaboration with subject matter experts that could help design, organize, test and evaluate the selected approaches to integrate oral health into primary health care for pregnant women and infants. The goals of the NLN were to strengthen statewide partnership and collaboration, and enhance knowledge transfer between the participants. The NLN partners participated in monthly online forums and learning sessions and regular face-to-face workshops and learning forums.

As designed, the NLN provided the opportunity for peer-to-peer learning in collaboration with other state teams. Highlights of the NLN meetings for the SC PIOHQI team included:

- **Year 1:** NLN conversations about Community Health Workers (CHWs) inspired the SC PIOHQI team to seek a CHW connection. In February 2017, the DOH presented the grant at the monthly South Carolina Community Health Workers meeting. This presentation led to formal Oral Health training by the DOH’s education consultant in Year 2.

- **Year 1:** Based on social marketing information from the Maryland team, the DOH vetted and utilized ten tweets in perinatal and infant oral health in several campaigns.

- **Year 1:** Attendance at the August 2016 NLN meetings further introduced team members to the importance of learning laboratories and the processes by which to develop a successful learning lab partnership. Based on these learnings, the PIOHQI initiated Learning Laboratories with partners in the Richland and Fairfield Counties’ target area.

- **Year 2:** Sessions like "figuring out the right ask for providers" helped the DOH team improve its TA capacity for regional partners. We used some of what we learned to help them identify potential partners and we created a Provider Recruitment Packet for their use.

- **Year 2:** Based on knowledge sharing with other teams, the SC DOH team modified its approach to recruiting FQHCs. During our meeting with the Colorado team, we learned about their strategies to recruit and train providers. The DOH team used those tools that were applicable to the structure of the SC project, and two months after the meeting, entered into a formal agreement with a FQHC.

- **Year 2:** The NLN pre-work included a presentation about an “innovation or a mistake.” Dr. Spencer Moore, the Network Analyst and Evaluator for the project presented on the SC PIOHQI Network Analysis Model. The corresponding session at the learning event allowed our team to learn about what other states are doing in a way that was very holistic.

- **Year 2:** The SC Team also was engaged in the discussion led by the FrameShift Group to guide the development of the agenda for the May In-Person meeting. The fact that input was requested and acted upon sent a positive message about the commitment of the COHSII team to provide relevant and useful content to the state teams attending the In-Person meetings.
- Year 3: The focus on PIOHQI sustainability in the October 2018 meetings allowed the PIOHQI team to reflect on and think critically about the integration of PIOHQI accomplishments within the health care structure. It also provided the opportunity to learn from other states how sustainability may be fostered before the end of the grant.

- Year 3: The creation of a SC PIOHQI infograph gave the SC state team the opportunity to develop summative and promotional materials on the PIOHQI project and its successes.

In addition to the NLN face-to-face meetings, members of the SC team were regular attendees of the online learning sessions, and benefited from the sharing of its accomplishments as well as hearing about the progress of other state teams.

D. Contributions to the Strategic Framework

To assure program sustainability, awardees were to articulate and a clear and comprehensive strategic framework built on achievements and lessons learned. The Strategic Framework was to include a profile of population needs and resources, plans for capacity building, and an approach that utilized a health care delivery system with statewide approach.

1. Profile population needs, resources, and readiness to address the problems and gaps in service delivery.

By working with the community partners and the Project Advisory Board, the DOH engaged perinatal and early childhood system providers in identifying surveillance data from sources such as Medicaid and PRAMS into context. These data can be used to understand the challenges in providing dental preventive services in primary care settings as well as fostering a warm hand off to an appropriate provider. The project used Diffusion of Innovation Theory to identify change agents, opportunities for improvement, and vulnerabilities in the system. As PIOHQI activities were increasingly taken up in the Regions, there was sustained attention on the spreading oral health messages from service providers to clients and referrals from pediatricians to dental offices.

2. Mobilize and/or build capacity to address needs

The South Carolina PIOHQI team experienced great success in garnering interest from stakeholders around the state including The SC Primary Health Care Association, the SC Dental Association, and the SC Chapter of the American Academy of Pediatrics. This was an integral part in getting medical and dental providers to attend the training events that was later made available to the public. The PIOHQI Regional Teams also built capacity at the local level as they interacted with local coalitions, trained childcare providers and community-based groups.

The aforementioned PIOHQI partners, including the SC Primary Health Care Association and the SC Dental Association, secured continuing education credit for the PIOHQI training for medical and dental providers. As a result, providers had at least five opportunities to earn credit and be trained. Medical providers had two opportunities for training and certification for Medicaid reimbursement for providing fluoride varnish. This structured approach with these partners will enable the SC PIOHQI staff to provide technical assistance across the state to health systems, provider practices, FQHC’s and community centers. Providers
participating in future trainings will be given the opportunity to request technical assistance that would make it possible to proportionately impact providers across all four public health regions.

3. Develop a strategic approach for implementation that utilizes an integrated health care delivery system with statewide reach.
Throughout the grant period, the project leveraged existing partnerships that are experiencing success with oral health integration models to develop a statewide strategic plan for ensuring quality health care, as defined in the HRSA Integrating Oral Health into Primary Care Report. The goals are multiple, including the continued diffusion of the oral health messages throughout SC’s perinatal and early childhood systems. The SC Oral Health Surveillance Initiative (SCOHSI) will continue to use the following principles, strategic approaches and lines of actions to guide its work:

- Health policy and advocacy
- Health promotion and disease prevention
- Surveillance
- Integrated management of dental diseases and conditions, and associated risk factors.

SCOHSI will continue to strengthen referrals and relationships among primary, secondary, and tertiary levels of care. The entire spectrum of dental disease management needs is engaged including prevention, screening, early detection, diagnosis, treatment, self-care, rehabilitation, and palliative care. The PIOHQI experience that the SC team had in data collection and identifying advocates, obstacles and opportunities will be beneficial in the further development of the surveillance system.

4. Implement evidence-based prevention policies, programs and practices and infrastructure development activities
Over the grant period, SC PIOHQI made Oral Health 10, a certified oral health training available to Head Start and Early Head Start centers in the selected counties. This work built on the fact that South Carolina implemented evidence-based prevention policies related to Head Start and school-aged children in 2016. Similarly, the DOH’s certified Oral Health training is available online for providers who want certification to qualify for Medicaid reimbursement of fluoride varnish application. Through continued collaboration with DHEC regional staff, the DOH are able to provide technical assistance and supportive services to achieve PIOHQI goals.

In addition, the SC Division of Oral Health Director and PIOHQI Team members collaborated with the SC Department of Health and Human Services (DHHS) to establish a new periodicity schedule and fluoride varnish reimbursement policy that allows reimbursement for medical providers to provide varnish for up to four times a year. This reflected an increase over the previous policy, which only covered two times a year.

5. Monitor the approach, evaluate effectiveness, sustain effective programs/activities, and improve or replace those that fail.
The SC PIOHQI team developed multiple data collection tools and assessment instruments for collecting and monitoring activities related to training and educational activities, network capacity building and expansion, referral processes and maps, and population-based surveillance data at the local and state levels. In addition, Learning Lab activities provided insights on the type of oral health data that can be collected
from pediatric, OB/Gyn. and dental offices. These tools also allow the DOH to assess in which areas the trainings and resources have taken hold and where they have yet to be established. The DOH PIOHQI Team used this information to fine tune what has worked and support the Regions that need additional technical assistance.

IV. SIGNIFICANT CHANGES

There were several significant additions to program activities after the project was initiated:

A. Learning Labs

As part of its education and outreach obligations to the division, the SC PIOHQI program added a Learning Lab component to its program activities in 2017. The SCDA established agreements with the Eau Claire Cooperative Health Center (Eau Claire), a Federally Qualified Health Center, and the Palmetto Healthy Start initiative, a former home visiting partner.

The SC PIOHQI Team through the South Carolina Dental Association entered into an agreement with Eau Claire Cooperative Health Centers (ECCHC) in 2017. The goal was to “Integrate consistent preventive oral health messaging and behavioral risk assessment tools for pregnant women and infants into at least 2 ECCHC sites in Richland and Fairfield counties as well as within their Healthy Steps home visitation program.” The work with Eau Claire was to include the use of the Model for Improvement and PDSA cycles on available tools for disseminating educational messages in OB, pediatric and family practice offices by building of the successes of previous projects in South Carolina.

Palmetto Healthy Start (PHS) is a member of the national Healthy Start initiative and was identified as a home visitation learning lab partner. They serve pregnant teens in one of our eight focus counties, Richland County. They provide support to their clients throughout their pregnancy to their child’s second birthday. They offer childbirth education classes, breastfeeding classes, pregnancy classes, case management, support from social workers, assistance finding emergency services, support groups and a fatherhood initiative. The goal of DOH work with Palmetto Healthy Start was to test the home visitation training that was personalized to fit their organization. It was intended to test a process for integrating oral health into a program that serves pregnant women and infants ages 0-3 years. It also had the underlying goal of increasing the capacity of PHS staff to act as conveners of oral health messages and as oral health care facilitators.

B. Social Media Outreach

To increase oral health message delivery amongst the target population and the providers who serve these patients, the DOH collaborated with the SC Oral Health Coalition to launch a social media campaign that fostered awareness of the Coalition’s Connecting Smiles website (www.connectingsmiles.sc.org). This was fostered by a Facebook campaign (https://www.facebook.com/SCORALHEALTH) in April 2018. The core principle of social media is the ability to share content with others. Facebook, among many other social networking sites allows users to share and interact with online content and to connect with like-minded people. Its strengths – rapid dissemination and amplification of content and the ability to lead informal conversations – make it a powerful tool to use. The main goals of the social media campaign were to further (i) awareness and knowledge on the importance of oral health for pregnant women and infants, (ii) act as a
resource site for dental and medical providers and community agencies, and (iii) provide general support to program objectives.

C. Regional Initiatives

While the Regions were an important part of program activities from the beginning, DOH elected to place greater focus and attention on regional initiatives as the program unfolded. DOH did this by implementing bi-monthly webinars like those that we participate in with the COHSII team. During these webinars the PIOHQI Team reinforced oral health information and encouraged dialogue within the Regions as they shared their successes and challenges engaging partners. Time was spent at webinars and meetings in discussing how to interact and connect with existing and new partners around oral health. The DOH also provided training and presentation tools that the Regions could use to connect with community-based programs and childcare settings that serve pregnant women and children 0-3. It was also during this time that the Regional Teams were provided technical assistance on how to capture their activities in a database shared with each of the regions.

V. EVALUATION

A. Methods

Mixed methods – quantitative and network analysis – were used to evaluate the effectiveness of the PIOHQI program. Measures were to be taken from several key sources: (i) process measures documented through collaboration with key partners and collected using pre- and post-surveys at training sessions, (ii) population-based outcome and impact measures documented through the state DOH and statewide surveillance and data systems and Medicaid databases, and (iii) network and organizational data collected on multiple occasions through the surveying of regional DHEC representatives and oral health and primary care providers in various settings across SC.

Survey methods were to be used to assess the composition, structure, and evolution of the PIOHQI network over the program period. The format and content of the main PIOHQI questionnaire was developed in consultation with PIOHQI program staff. The online questionnaire was pretested among community members, provider groups, and SC state employees. Revisions to the questionnaire were made based on respondent feedback.

Our network mapping tool was designed with three aims in mind: being respondent friendly, allowing the collection of valid and usable network data, and enabling assessment of changes in organizational perceptions of the Oral Health Network.

The social network module included two network name generator questions meant to ask respondents about other organizations (i) with which they have already worked in health care and (ii) with which they don’t yet work but consider them important for oral health care in SC. Organizations could name up to five other organizations for name generator question one and up to three organizations for question two. Once an organization was named, the respondent was asked to provide additional information about their relationship with that organization (e.g., did they have a formal, written partnership). These questions allowed us to map the network as seen by the specific community of respondents and characterize the
composition of that network (e.g., percentage of medical versus dental providers). Statewide network data along with organizational data on the Region’s perceptions on the effectiveness of PIOHQI were collected at project initiation.

At the DHEC Regional Level, network data were collected on four occasions over the grant period: i) October 2016; ii) March 2017; iii) June 2018, and iv) May 2019. At least one CSD or regional staff member completed the network survey on these occasions. In pre- and post-test analyses, paired sample t-tests were use to examine whether there were changes in the regional networks from the beginning (Year 1) of the PIOHQI program to its end (Year 3).

B. Increase opportunities for access to oral health care

Training sessions on network building and mapping was undertaken during the PIOHQI grant period with the DHEC Region CSDs and representatives. The objective of these sessions was to acquaint the CSDs and their staff with the goals and objectives of the project and to seek their buy in and input. These sessions took place in the fall of 2016. Each CSD was asked to identify two or three individuals from the target counties to serve as PIOHQI Regional Team members. These individuals, along with the CSDs, were invited to participate in a day long learning collaborative held in February 2017. During this session, the team members were provided with information about perinatal and infant oral health, including key preventive messages, SC statistics and evidence-based interventions. The team members participated in the first network survey and in a brainstorming session to identify potential community partners, including medical and dental providers as well as community-based programs.

Subsequent support sessions for these PIOHQI Regional Teams were held via webinars and check-in conference calls. The original plan was to equip these regional teams to provide training to medical and dental providers as well as community program staff; however, as the DOH staff interacted with the regional teams, it was clear that the teams were not comfortable with addressing the clinical components of the provider trainings. With this revelation, a programmatic milestone occurred and the regional teams were charged with recruiting providers to state level trainings that would be led by clinical staff members. These trainings included sessions held at the SC Dental Association conference in April 2017 and 2018 and at the SC Primary Healthcare Association Clinical Retreat held in June 2018. This adjustment allowed the regional teams to serve as liaisons and connectors to support the expansion of the Oral Health Networks within their communities. Despite this change of direction with providers, the PIOHQI teams took an active role in recruiting and training community-based program staff as well as instituting and integrating oral health internally within DHEC’s infrastructure.

Over the PIOHQI grant period, there was a significant increase in the size of regional networks. Whereas DHEC Regions had an average network size of 5.5 organizations in Year 1, the average network size increased to 18.8. This change represented an average increase of 13.3 partners over the grant period, which suggests an increase in the capacity of CSDs at Regional offices to scan and identify local dental, medical, and community providers in the field of oral health care. Figure 5 shows the composition of the regional network capacity building: Of the 13.3 organizations newly identified by each region, 4.5 organizations were contacted specifically because of PIOHQI; 7.0 organizations were contacted during the grant period for different reasons, including PIOHQI; and 1.8 organizations were not contacted at the time of writing.
These findings suggest two aspects of the Regional partnership building process. First, CSDs and regional personnel leveraged previous relationships with providers to contact and spread information about oral health care for pregnant women, children, and infants. Second, PIOHQI provided impetus for CSDs to contact certain providers that they may have not in the past, even though as noted earlier there was a hesitancy to contact dental providers. This was confirmed in closing interviews with regional personnel who noted their initial use of pre-existing contacts to help identify other organizations and agencies that might include oral health care under their programming or how they may have developed a connection with a medical provider while delivering training in perinatal and infant oral health to an interagency coalition.

C. Increase opportunities for training on oral health care

The project sought to foster training and inter-professional education programs in the effort to improve the consistency, accuracy, and timeliness of oral health messaging across the state. This education was to occur at the community and provider level as well as at the formal professional level. At the community/provider level, the goals of the state program leveraged regional DHEC resources and personnel (e.g., Community Systems Development staffers) to (i) disseminate accurate and timely oral health education to and (ii) improve the knowledge of new audiences of pregnant women/mothers and dental and medical clinicians. Professional education programs were to be coordinated by the state DHEC DOH through partnerships with the College of Dental Medicine at MUSC, the SCDA, and the SC chapter of the AAP QTIP program. The goals of the professional training program were to (i) provide the most up-to-date information to dental providers about safe and effective oral health care for pregnant women and infants and (ii) increase the efficacy of these providers to appropriately care for pregnant mothers and infants.

1. Clinical and DHEC Staff Trainings

Table 3 lists the training sessions conducted by members of the state DOH PIOHQI team or the PAB over the grant period. In short, The DOH team or representatives of the team delivered 18 training sessions from 2017-2018 to a range of providers and community groups, including: (i) state service providers (e.g., DHEC staff, WIC, CSDs), (ii) medical and primary health care providers at venues such as the SC Primary Health Care Association, (iii) dental providers at venues such as the SC Dental Association Annual Meetings, (iv) FQHCs (e.g., Eau Claire Hopkins and Winnsboro), (v) community agencies (e.g., Frist Steps, Palmetto Healthy Start), and (vi) via media channels (e.g., Connecting Smiles website, Community Health TV). Where feasible, pre- and post-training session evaluations were conducted.

Clinical trainings were conducted utilizing a peer to peer approach and were primarily conducted by the Dental Director at the SC Department of Health and Environmental Control and two outside consultants who were assisting with the project. Using the training resources, the SC PIOHQI Team engaged with outside organizations to make these trainings available through statewide conferences. For example, the Regional Teams were asked to help make providers within the target counties aware of the training opportunities. The Safe and Effective Treatment of Pregnant Women and Infants for Dental Providers training was a part of the SC Dental Association Annual Conference held on May 3-6, 2018. Dr. Francisco Ramos Gomez, Director of UCLA Center for Children’s Oral Health (UCCOH) and Director of UCLA Pediatric Dentistry Advanced Clinical Training Program (ACT) delivered the training to dentists at the conference. The dentists were provided CE credits for their participation and were made aware of existing resources that are available to support their efforts to address perinatal and infant oral health. The PIOHQI
project manager was asked to participate on the planning team for the SC Primary Health Care Association’s 24th Annual Clinical Network Retreat. As a result, The Safe and Effective Treatment of Pregnant Women and Infants for Dental Providers was presented at the Annual Clinical Network Retreat to be held in June 2018. The SC Team is also working with the SC Dental Association to provide dental providers with CE credit to attend the above-mentioned training sessions at the SC Oral Health Coalition’s 16th Annual Forum set to take place in June 2018.

In early 2018, an online training for medical providers was also launched. Completion of this training, which is based on the Smiles for Life model, enabled providers to apply and be reimbursed for fluoride varnish treatments.

2. Regional trainings

The CSDs and their Regional Team members were continually engaged in oral health message delivery and network engagement strategies. This took place through in-person meetings and through webinars led by the DOH staff. To facilitate provider recruitment into the Network, the DOH team developed and disseminated a Provider Recruitment Packet that included strategies to engage providers, address perinatal and infant oral health, deliver target messages, and promote available trainings. A brief interest survey was also included. In an effort to clarify the community-based trainings that were offered to and through the Regional Teams, the DOH team created a system to designate trainings as Level 1, 2 or 3. The distinction was based largely on the audience. For example, in Level 1, Regional Team members were trained to provide brief and general oral health presentations to community-based coalitions and community groups with a health focus or a connection to target populations including pregnant women and/or infants. In Level 2, the Regional Teams designated 1-2 staff members to serve as certified oral health trainers. These staff members participated in a more intense “train the trainer” session and were provided with the training and resources needed to conduct certified childcare trainings as outlined by state regulations. The audience for these trainings were childcare providers, Early Head Start and Head Start staff. Finally, the Level 3 trainings were for groups that had direct contact with clients including pregnant women and parents/caregivers of children 0-3. These groups included, but were not limited to Palmetto Healthy Start, BabyNet, Nurse Family Partnership and all home visitation programs. DHEC Regional Teams were responsible for making initial contact with the groups that existed within their local community, however, the DOH team was responsible for conducting the actual training. Rosters were used at all the Level 1-3 trainings to ensure that a link to a follow-up survey could be sent to all participants. This systematic approach to training and outreach helped to ensure effective message delivery and increase the successful expansion of the oral health network.

As a result of training and equipping the regions with supportive resources, the internal and external integration of oral health messages for pregnant women and infants targeted towards community-based groups, primary care provider practices and within public health settings took place within all four Health Regions. The PIOHQI Regional Teams facilitated opportunities for dentists to learn about best practices for treating pregnant women and infants, and they assisted primary care practices in acquiring the training and know-how to provide preventive oral health care for pregnant women and infants. Some specific outcomes included: training community agencies/organizations, Head Start programs, Newborn Home Visitation Staff, and dental and medical providers about oral health messages and best practices; successfully integrating Oral Health messages and education into Health Department clinical services; creating packets to distribute to mothers/caregivers in targeted counties through WIC programs; and delivering materials
and resources to medical providers, dental providers, and community agencies/organizations to spread awareness and expand the network. Over 5000 packets were compiled and distributed across the health regions.

**Training Evaluations:** Training sessions with regional teams focused on oral health messaging, quality improvement, and networking and working with local clinics and dental providers. The webinars were based on the COHSII model of the monthly online learning events and proved very valuable in staying connected to the teams in the field. Using a 5-point Likert scale from strongly disagree to strongly agree, we assessed the degree to which SC PIOHQI activities may have increased:

- CSD awareness and knowledge of oral health programs for pregnant women, infant, and children (5 items)
- Interest in programs related to oral health for pregnant women and children (5 items)
- Confidence in the ability of the PIOHQI system to change oral health care at the individual, organizational, and policy levels (6 items)
- Confidence in their own ability to develop and manage relationships with local community, dental, and medical providers (6 items)

Table 4 provides the results of paired samples t-tests. First, awareness and knowledge of PIOHQI programs and confidence increased from 11.8 to 14.4. Second, confidence in own organization also significantly increased from 13.7 to 19.0 from Year 1 to the beginning of Year 3. However, the program did not show significant increases in CSD interest in PIOHQI, with a change from 16.4 to 17.4. Although interest increased, this was not a significant increase, perhaps due to the already high levels of interest in place. Finally, there was an increase in CSD confidence in PIOHQI to affect upstream change but this was not a statistically significant increase: 14.9 to 17.4. However, CSDs did show themselves to have more confidence in PIOHQI’s ability to increase oral health messaging to pregnant women and children but less or no confidence in making more systemic improvements.

**D. Increase opportunities for outreach and oral health care**

The Community System Directors (CSDs), who are located within the four Public Health Regions, were identified as key agents of change that might be incentivized to build and consolidate local networks of oral health care. Community systems development staffers were trained in each of the four DHEC regions to (i) expand the care coordination efforts in high need communities to include oral health services, (ii) provide accurate oral health messages and care coordination through faith-based organizations, community outreach organizations, and family medicine and obstetrics and gynecology practices; (iii) expand the local network of health care providers to treat pregnant women and infants for oral health issues; and (iv) contribute to the development of a statewide coordination and referral network to support access to oral health care among pregnant women and infants.

After they had been trained, regional CSDs and personnel engaged with and trained local agencies and organizations. Table 5 provides information from the regional DHEC staff and CSDs about their training sessions with local providers and community groups. Regions conducted on average 7 additional training sessions (~28 training sessions in total), with an average of 9.6 participants per session. At the regional level, training sessions tended to be with community agencies or parent groups. These results thus support what the DHEC Regional personnel highlighted in the closing interviews, which was that they felt more confident and comfortable in establishing contact with and delivering oral health messages to community
agencies and parent groups, rather than dental or medical providers. DHEC staff were less accustomed to working with and engaging dental providers. However, regional staff were engaged strongly with community groups and boards, such as First Steps or Interagency Coalitions within their counties. In such cases, they might leverage their pre-existing ties to or work with these coalitions to identify and contact another organization that might cover dental or oral health in their programming. The educational and informational materials and other resources, such as tooth brushes, were noted as being of particular value in establishing these new relationships and in delivering oral health messages to community groups.

E. Increase opportunities for utilization of oral health care

At the state level, the DOH sought to develop DHEC infrastructure and policy to support statewide oral health activities and outcomes. These activities were to entail (i) the integration of oral health messaging and coordination into clinical services provided by DHEC; (ii) the linkage of PRAMS and CHAS data to Medicaid claims data to allow for more complete assessment of risk factors, behaviors, and oral health outcomes for an important, high-risk subpopulation of pregnant women, infants, and children; and (iii) develop and adopt evidence-based policies and practices in support of oral health care in SC.

F. Telling Your Story

1. The ECCHC Pediatric and Obstetrics Learning Lab

With support of the SC Dental Association, the SC PIOHQI Team entered into an agreement with Eau Claire Cooperative Health Centers (ECCHC). The goal was to “Integrate consistent preventive oral health messaging and behavioral risk assessment tools for pregnant women and infants into at least 2 ECCHC sites in Richland and Fairfield counties.” The activities agreed on included:

- SC PIOHQI TEAM staff would work with the ECCHC medical director to develop a plan to integrate oral health messages for pregnant women and infants into patient education and outreach.
- SC PIOHQI TEAM staff would provide needed training and support for medical staff to be certified for fluoride varnish application.
- SC PIOHQI TEAM staff would work with the medical director to develop informational resources for patients and these will be field tested in at least 2 of ECCHC sites.
- SC PIOHQI TEAM staff would identify potential QI exercises that would further refine the quality of the materials, the delivery of message and the impact of oral health integration.
- SC PIOHQI TEAM staff would survey and train Healthy Steps home visitation staff in oral health messaging and behavioral assessments.
- ECCHC staff would integrate oral health education into their services to pregnant women and infants.

There were challenges in getting the trainings scheduled within the original timeframe. The identified sites seemed hesitant to provide the PIOHQI team with a 60-minute block of time that would enable the entire staff to be trained. However, after a slight delay the training at the family medicine/pediatric site in Winnsboro was scheduled and took place on February 2, 2018. This training included information on preventive oral health messaging, risk assessment and referrals. The Quality Improvement consultant led the group through a process mapping activity to determine the most effective way to integrate oral health
into their site. The medical director at ECCHC wanted the staff to also be trained in fluoride varnish application.

Due to time constraints with the staff, the initial training did not allow for sufficient time to complete the fluoride varnish component. Another training took place on March 5, 2018. At that time, the PIOHQI team reviewed the preventive messaging covered in the first training, introduced the benefits of fluoride varnish and conducted a demonstration with the staff. The staff and the team also revisited the process map and made some adjustments as reflected below.

The second site selected by the medical director was a location that sees OB patients bi-weekly. That training was scheduled for and took place on February 21, 2018. The training focused on the importance of oral health including dental care during pregnancy, risk assessment and referrals. The CMA’s managers and OB’s were engaged in conversations around implementation and expressed a desire to proceed immediately with a single OB patient.

Based on the discussions that were taking place within this group, the SC PIOHQI staff discovered that there was a need for a systematic process and consistent form for oral health referrals. ECCHC has both medical and dental sites, but the PIOHQI team realized that the dialogue and connection between medical and dental was limited. The Project Coordinator worked with the staff to designate a referral code and worked with them to redefine the referral process. As with the previous training, the QI consultant worked with the group and walked them through the process map for assessing a pregnant woman and making a referral. The process maps in the Supporting Documents illustrate those developments.

2. Home Visitation Learning Lab – Palmetto Healthy Start

Palmetto Healthy Start (PHS), our home visitation learning lab partner, is a member of the national Healthy Start initiative. They serve pregnant teens in one of our eight focus counties, Richland County. They provide support to their clients throughout their pregnancy to their child’s second birthday. They offer childbirth education classes, breastfeeding classes, pregnancy classes, case management, support from social workers, assistance finding emergency services, support groups and a fatherhood initiative. Each client is assigned a community health worker called a “Resource Mother”.

Twenty-four women were selected for the project with PHS. Six women were selected from each of the four risk designations that PHS places their clients in, based on their initial assessment. All women had children that were younger than 6 months. This was because PHS indicated that mothers often leave the program after their children become 6 months old. We chose to include oral health messaging and direct assistance within the PHS curriculum prior to the 6-month mark to increase the likelihood of a mother receiving the information before leaving the program.

The goal of our work with Palmetto Healthy Start was to test the home visitation training that was personalized to fit their organization. It was intended to test a process for integrating oral health into a program that serves pregnant women and infants ages 0-3 years. It also had the underlying goal of increasing the capacity of PHS staff to act as conveners of oral health messages and as oral health care facilitators. Additionally, the goal was to reduce the number of pregnant women and babies who do not have a dental home by 10%.
The resources provided to PHS were as follows:

- The surveys for staff and clients were given to the PHS leadership ahead of the start of the project’s implementation. This included a staff script that helped the Resource Mothers explain the purpose of the effort to their clients.
- They received a Brush, Brush, Brush board book for each of the participating clients.
- They received toothbrushes and finger brushes to disseminate to each participant.

In 2018, they will receive a resource booklet, Oral Health for Families with Special Needs, to meet the needs of their clients whose children have special needs. This identified need will translate to an augmentation of the home visitation training to include information pertaining to the special needs population.

Assessments have examined knowledge and perceived capacity of the staff members to provide oral health messages and care coordination. The first and second assessments were conducted before and after the initial training. A third assessment was conducted a month after the training to assess the retention of the oral health information and to access the staff capacity to deliver the messages and to provide oral health care facilitation and navigation for clients. The fourth assessment is of actual clients who are receiving services and will reveal changes in client knowledge of oral health messages and utilization of oral health services over time.

VI. IMPACT

A. Resources

The DOH staff in collaboration with outside subject matter experts developed three trainings for medical and dental providers including:

a. **The Safe and Effective Treatment of Pregnant Women and Infants for Dental Providers.**
   Goal of the Training Materials: To equip dental providers with the knowledge and resources needed to safely and effectively treat pregnant women including risk assessment and preventive oral health message delivery.

b. **Improving Oral Health through Integration within the OB Setting for Medical Providers.**
   Goal of the Training: To equip obstetricians and office staff with the knowledge and resources needed to effectively integrate oral health within the medical setting including risk assessment and preventive oral health message delivery.

c. **Improving Oral Health through Integration within the Pediatric Setting for Medical Providers.**
   Goal of the Training: To equip medical providers and office staff with the knowledge and resources needed to effectively integrate oral health into the medical practice including risk assessment, preventive oral health message delivery and fluoride varnish application.

These trainings were made available to providers through professional organizations including the SC Primary Health Care Association, the SC Dental Association and the Birth Outcomes Initiative (BOI). Additionally, an online training for medical providers was created and recognized by the SC Medicaid Agency as pre-requisite for applying and billing for fluoride varnish.
DOH staff also expanded the Oral Health 101 Training for Childcare Providers to include information on oral health and pregnant women. This is a certified training for childcare providers that fulfills continuing education requirements in the area of health and safety. In addition, a training for home visitors, Reaching the Family with an Oral Health Message was also updated with PIOHQI information.

B. Online tools for expanding project efforts

Connecting Smiles website. The Coalition’s Facebook page was a catalyst in driving traffic to various websites, including SCDA.org, sedhec.gov, and connectingsmiles_sc.org. Figure 2 illustrates graphically the number of users on the Connecting Smiles website from its launch to present.

Over this same period, 65% of the traffic to the website were from direct URL insertions; 15% were from social media (mainly Facebook); 13% were from search engines; and 7% were from referral websites.

Besides the home page, the most frequently visited pages on the Connecting Smiles website included the pages for educational resources for parents and families and the medical and dental providers. These pages highlight the importance of oral health care for pregnant women and infants.

The Connecting Smiles website that includes information and resources related to the PIOHQI initiative will continue to be updated and enhanced. At the conclusion of the project, it will include a catalog of all the resources created over the course of the grant and a dashboard that displays surveillance data.

C. Network System Mapping Tools

Recent research in social network analysis (SNA) has highlighted the utility of network thinking and methodology in the design, implementation, and evaluation of interventions that promote inter-organizational relationships and collaboration. SNA provides a set of methods and tools for formally measuring the strength of social connections among organizations as well as the overall connectivity of a network. SNA does this by (i) defining the boundaries or criteria of membership in an inter-organizational network (i.e., who is in and who is out), (ii) identifying the salient relationships within a network (e.g., information sharing), (iii) surveying organizations about their relationship to each of the other network organizations, and (iv) compiling the survey responses into a data matrix in which the cell values in the matrix represent the presence or absence of a tie between any two organizations. Practitioners and stakeholders can use these data to understand the structure of a network (e.g., which organizations are more central or peripheral), identify those gaps in network connectivity that should be filled, surveil changes in the network over time, and examine whether changes in the network lead to changes in organizational outcomes.

Figure 3 shows the statewide network related to perinatal and infant oral health as of the Fall 2016. Organizational names were removed from the Figure to protect confidentiality. The 25 organizations that completed the survey identified a total of 76 organizations that they were already working with or considered them important for their work as part of the PIOHQI project. Figure 3 distinguishes the network by the type of stakeholder that the organization represents. Red circles represent government organizations; black circles are community-based organizations (CBOs); green circles are dental providers;
while blue ones represent medical providers. In this case, the size of the circle is proportionate to its value in bridging key areas of the network.

Pre-PIOHQI Regional Networks: The response rate for the February 2017 PIOHQI Regional Training session was 46%. Figure 4 illustrates the network as reported by 12 participating regional staff and CSDs (red nodes). These 12 respondents identified medical providers (blue circles, n=14), dental providers (green circles, n=6), community-based organizations (black circles, n=5). There was one other government agency noted by respondents (also shown as red node).

D. Policy Change

Through PIOHQI activities, including the support of the PAB, the DOH was able to initiate policy change in several areas:

1. **Medicaid Fluoride Varnish Periodicity Schedule**

The SC Division of Oral Health Director and PIOHQI Team members collaborated with the SC Department of Health and Human Services (DHHS) to establish a new periodicity schedule and fluoride varnish reimbursement policy that allows reimbursement up to 4 times a year.

In summary, SC Medicaid will reimburse for Fluoride Varnish applied in the medical setting at the eruption of first tooth through the month of the 21st birthday. Children ages 0-6 (up to the month of the 7th birthday) may receive up to four (4) applications per year. Children ages 7-20 (though the month of the 21st birthday) may receive one (1) application per year. Fluoride varnish can be applied during well or sick visits.

Application of fluoride varnish by a dental provider does not count towards the allowed number of applications per year that a child can receive in the medical setting. Ultimately, children at risk for tooth decay will now be able to benefit from increased application frequency of every 3 to 4 months. The PIOHQI grant was instrumental in helping to move this policy to fruition as the grant provided an opportunity for increased dialogue and raised awareness amongst vested parties.

Figure 5 reflects the increase in the number of Medicaid children receiving fluoride varnish in non-dental setting.

2. **WIC Fluoride Varnish Pilot**

A key and sustainable policy was established at SCDHEC as a result of the PIOHQI grant. As of November 2018, nurses who work within WIC immunization clinics have the authority to apply fluoride varnish to their clients. This required the creation and approval of an new Fluoride Varnish Policy as well as the development of Standing Orders for DHEC nurses. The Policy Statement states: DHEC will provide fluoride varnish application to children attending WIC and Immunization appointments at DHEC sites. At this point, the initiative is being piloted at two sites with plans for statewide expansion. This is the first oral health related policy to be included within the DHEC Policy Manual.

3. **Surveillance and Data Advances.**
As part of PIOHQI activities, oral health questions have been included in the PRAMS & CHAS survey. In addition, steps have been taken to link Medicaid data with PRAMS and CHAS data.

**E. Lessons Learned**

1. **Establishing Public Health Regionally-based Teams**

   It was crucial to the long-term success of the project for the CSDs and their teams to be encouraged to be active participants in the design of the approach at the regional level. It was not a top-down initiative, but a team-based approach. The DOH team provided opportunities for dialogue and discussion regarding what was working and what needed to be altered or changed. For example, when the DOH team encountered the barrier of training providers through the regions, they responded with an alternative approach that enabled the Regional Team to act in the role of recruiter versus trainer. It was important to celebrate and acknowledge the successes achieved by the Regional Teams. A portion of the SC Oral Health Coalition’s Annual Forum was set aside for the Regional Teams to showcase and present their successes and highlight the network expansion to oral health stakeholders from across the state who were in attendance. By engaging the Public Health Regionally-based Teams the oral health capacity at the Agency level increased significantly allowing for the programmatic spread of oral health education, resources and trainings.

2. **Regional Network Capacity Building, particularly with dental providers**

   Regional teams were more accustomed in developing contacts and relationships with community groups and primary health care providers than dental providers. While the DOH team assumed a greater role in building the dental connections, after the regional teams identified this matter, there is still a need for local DHEC personnel and CSDs to feel confident in developing stronger relationships with the dental providers in their area. While the general lack of dental providers in the targeted counties might suggest that building such connections would be easier (i.e., fewer to get to know), the lack of dental providers also means that those providers may have less time or need to work outside their conventional dental practices and procedures. From the study interviews, it would also seem that dental providers may be less likely to be a part of interagency coalitions or other community groups compared to primary health care providers or members of the local FQHC. In short, extended and targeted attention to local dental providers that seeks to work from the top-down (e.g., through Dental Associations) and bottom-up (e.g., through the local CSD) needs to occur to secure more sustainable access for pregnant women and infants. The lack of dental providers remains a substantial barrier to access for low-income pregnant women and infants.

3. **Resources are critical**

   Resources are a needed component in efforts to increase pregnant women’s and infants’ access to, use of, or knowledge of oral health care. Whether those resources are educational materials, such as pamphlets, brochures, or dental resources, such as tooth brushes, they are important in establishing the social connections and dissemination of the broader message about oral health care. Not only do such resources serve the main purpose of helping to educate others about oral health care and support training activities, but they also help to open doors and thus build social connections related to oral health.

4. **Lessons learned in SNA:**
**Population parameters:** Undertaking the mapping of the whole network required a census of members in that network. These listings can sometimes be incomplete, particularly at the local level where turnover, new openings and closings often create gaps in the listing. Snowball sampling, which involves asking one organization to name other organizations in the network and so on, is one approach to addressing the problem of an incomplete knowledge of potential network members. In hindsight, these methods could have been employed with CSDs sooner, so as to build a more complete listing of regional network members. Having a workable list from CSDs earlier in the grant period would have allowed network mapping to take place sooner and created additional opportunities to build the capacity of confidence of CSDs.

**Network relationships:** Given the novelty of network mapping among Public Health Regions, few were aware of network analysis methods and the utility that such maps might offer in practice. As a result, we had to limit the depth and breadth of the network relationships being mapped over the grant period. In more evolved networks, a range of network relationship types might be mapped, thereby giving a more comprehensive and in-depth picture of local and regional referral networks.

**Localized mapping:** Given the success seen in building CSD confidence in developing relationships with local dental, medical, and community providers, it may be fruitful to localize the network mapping so that CSDs could develop, maintain, and evaluate the evolution of their local referral networks independent of the main program team. This would involve more extensive training (and time) in network analysis methods as well as the creation of a local database for maintaining this information. However, such localized network mapping resources would likely create additional CSD buy-in, contribute greatly to capacity building, and the further growth of local referral networks.

**VII. Plans for No-Cost Extension**

This is a No-Cost Extension request for the unobligated balance from the 2018-2019 grant year for HRSA GRANT H47MC29817, which was granted to the state of South Carolina in June 2016. The unobligated balance includes funds designated for key staff roles, regional operations and operational grant supplies. In total, the Division of Oral Health has $140,000 in unobligated balance for the 2018-2019 grant period.

The Program Coordinator position was filled for 3 months and then vacated again during Year 3 of the grant (incumbent found position with state FTE). The Division of Oral Health was able to fill the vacant administrative assistant position for the grant (PIOHQI on October 17, 2018. Vacancies resulted in the inability to use all the designated funds on time.

To assist in sustaining the efforts to improve oral health for pregnant women and infants, we plan to extend the work of consultants and contractors to focus on expanding the use of outreach and social media materials, electronically archiving previously developed materials for easy retrieval by partners and stakeholders, data collection and analysis, dissemination of findings from grant activities, network analysis and reporting. We will also continue salary support at 50% for the administrative assistant to support communications efforts including material distribution for the regional office staff and external stakeholders.

The Division of Oral Health plans to modify ($27,888) the agency’s existing Arnold School of Public Health at the University of South Carolina to secure faculty expertise and technical assistance on evaluation and quality improvement initiatives for medical and dental providers, and community education opportunities,
instructional design services for educational materials and network development analysis and reporting related to grant objectives. To support the evaluation and QI activities, we will extend our contract ($6,250) we will modify an existing contract with the state mandated data warehouse at the SC Revenue and Fiscal Affairs agency. This contract will support data linkages with Medicaid dental and medical claims data to evaluate progress on the medical-dental integration to improve oral health status of pregnant women and infants. We will modify the existing contract ($51,732) with the SC Dental Association to extend efforts to expand and evaluate the OH Network, communications and outreach, dissemination of educational materials and trainings, and preparation of materials for electronic archives. We will extend support ($20,000) to the DHEC Regional Offices to assist with network expansion activities, community education and outreach services and provider relationship development statewide.

We will support travel ($1924) to the National Oral Health Conference for the program coordinator assigned to continue the PIOHQI activities through medical-dental integration initiatives. The proposed activities are in alignment with the goals and objectives of the current approved work plan.

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VIII. Supporting Documents

Table 1: SC PIOHQI Project Advisory Board Summative Table
Table 2: Project Advisory Board Members List
Table 3: DHEC Training Sessions
Table 4: Regional Training Evaluation Assessments
Table 5: DHEC Region Training Sessions
Figure 1: Regional Network Capacity Building Tree Diagram
Figure 2: Connecting Smiles Website Hits (4/2018-4/2019)
Figure 3: State Network Diagram by Organizational Type
Figure 4: Regional Network Diagram by Organizational Type
Figure 5: Number of Medicaid children receiving fluoride varnish in non-dental setting.

Other Materials

1. Learning Lab Evaluation Materials
2. Developed Training Materials
Table 1: SC PIOHQI Project Advisory Board Summative Table

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Table 2: SC PIOHQI Project Advisory Board Members

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<td>6/16/16</td>
<td>SC Primary Health Care Association</td>
<td>Provider Association</td>
<td>Medical providers; Clinicians</td>
<td>Perinatal and infant oral health training</td>
</tr>
<tr>
<td>1/11/17</td>
<td>SC DHEC</td>
<td>State</td>
<td>DHEC OH Task Force; Pediatric Advisory Committee</td>
<td>Update the Task Force for the PIOHQI grant and seek input on guideline revision</td>
</tr>
<tr>
<td>1/22/17</td>
<td>SC DHEC/DOH</td>
<td>State</td>
<td>Regional DHEC Staff and OSD</td>
<td>Update the Task Force for the PIOHQI grant and seek input on guideline revision</td>
</tr>
<tr>
<td>2/27/17</td>
<td>SC DHEC/EAST</td>
<td>State</td>
<td>Medical Providers and Staff</td>
<td>Oral Health Integration into Pediatric Setting</td>
</tr>
<tr>
<td>3/31/17</td>
<td>SC DHEC</td>
<td>State</td>
<td>WIC; DHEC Regions; OSD</td>
<td>Train-in-trainer: Oral Health Messages; Quality Improvement; Regional work plan</td>
</tr>
<tr>
<td>7/14/17</td>
<td>SC Children’s Trust</td>
<td>Website</td>
<td>Children’s Trust Website; Online resources</td>
<td>Oral Health information Center on the Children’s Trust website</td>
</tr>
<tr>
<td>8/23/17</td>
<td>SC Primary Health Care Association</td>
<td>Provider Association</td>
<td>Physicians; Staff</td>
<td>OH for Women</td>
</tr>
<tr>
<td>9/3/17</td>
<td>East Clare Cooperative Health Center</td>
<td>PQRC</td>
<td>Clinicians; Staff</td>
<td>Oral Health Information Center on the Children’s Trust website</td>
</tr>
<tr>
<td>9/3/17</td>
<td>Palmetto Healthy Start</td>
<td>PHS</td>
<td>Palmetto Health Start Staff</td>
<td>Perinatal and infant oral health training</td>
</tr>
<tr>
<td>12/8/17</td>
<td>SC OH Coalition</td>
<td>State</td>
<td>OHM Stakeholders</td>
<td>Oral Health Information Center on the Children’s Trust website</td>
</tr>
<tr>
<td>2/18/18</td>
<td>East Clare Winemakers</td>
<td>PQRC</td>
<td>East Clare staff, preschool &amp; elementary</td>
<td>Perinatal and infant oral health training</td>
</tr>
<tr>
<td>2/27/18</td>
<td>East Clare Healthcare</td>
<td>PQRC</td>
<td>East Clare staff, preschool, and elementary</td>
<td>Perinatal and infant oral health training</td>
</tr>
<tr>
<td>3/14/18</td>
<td>SC DHEC/OHR</td>
<td>State</td>
<td>OH Providers and Interventionists</td>
<td>Perinatal OH in Birth Outcomes Initiative Meeting</td>
</tr>
<tr>
<td>3/15/18</td>
<td>Connecting States SC (website)</td>
<td>Online Training</td>
<td>Medical providers</td>
<td>Preventive and health messages delivery; fluoride varnish, risk assessment</td>
</tr>
<tr>
<td>5/31/18</td>
<td>SC Dental Association Meetings</td>
<td>Provider Association</td>
<td>Dr. F. Gomez; Dental Providers</td>
<td>Delivered “The Safe and Effective Treatment of Pregnant Women and Infants for...</td>
</tr>
<tr>
<td>6/19/18</td>
<td>SC Primary Health Care Association</td>
<td>Annual Clinical Network Reunion</td>
<td>DHEC Medical providers; clinicians</td>
<td>Delivered “The Safe and Effective Treatment of Pregnant Women and Infants for...</td>
</tr>
<tr>
<td>6/19/18</td>
<td>John A Martin Primary Care</td>
<td>Primary Care</td>
<td>Clinicians; Staff</td>
<td>Oral Health Integration into Pediatric Setting</td>
</tr>
<tr>
<td>6/19/18</td>
<td>SC OH Coalition</td>
<td>State</td>
<td>OHM Stakeholders</td>
<td>Oral Health Information Center on the Children’s Trust website</td>
</tr>
<tr>
<td>6/21/18</td>
<td>John A Martin Primary Care</td>
<td>Primary Care</td>
<td>Clinicians; Staff</td>
<td>Preventive and health messages delivery; fluoride varnish, risk assessment</td>
</tr>
<tr>
<td>9/14/18</td>
<td>Community Partners</td>
<td>Community Agencies</td>
<td>First Stage Community Agencies; Medical Providers</td>
<td>Preventive and health messages delivery; fluoride varnish, risk assessment</td>
</tr>
<tr>
<td>1/22/19</td>
<td>SC Primary Health Care Association</td>
<td>Clinical Staff</td>
<td>Clinicians; Staff</td>
<td>Preventive and health messages delivery; fluoride varnish, risk assessment</td>
</tr>
<tr>
<td>2/12/19</td>
<td>Jasper County</td>
<td>Health Department</td>
<td>WIC Staff</td>
<td>Preventive and health messages delivery; fluoride varnish, risk assessment</td>
</tr>
<tr>
<td>3/1/19</td>
<td>SC DHEC</td>
<td>Health Department</td>
<td>Nurses</td>
<td>Perinatal Oral Health Training</td>
</tr>
</tbody>
</table>

Table 4: Paired Samples t-tests Showing Change in PIOHQI Domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>No. Items</th>
<th>Likert Scale</th>
<th>Year 1 (average)</th>
<th>End Year 2 (average)</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness and knowledge</td>
<td>5</td>
<td>5 pt. - Strongly Disagree to Strongly Agree, with Don’t Know (range 0-20)</td>
<td>11.8</td>
<td>14.4</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Interest in programs</td>
<td>5</td>
<td>...</td>
<td>16.4</td>
<td>17.4</td>
<td>p&gt;0.05</td>
</tr>
<tr>
<td>Confidence in PIOHQI</td>
<td>6</td>
<td>...</td>
<td>14.9</td>
<td>17.4</td>
<td>p&gt;0.05</td>
</tr>
<tr>
<td>Confidence in own network building capacity</td>
<td>6</td>
<td>...</td>
<td>13.7</td>
<td>19.0</td>
<td>p&lt;0.05</td>
</tr>
</tbody>
</table>

Table 5: DHEC Region Training Sessions

| % of regions with at least one training session | 100% |
| % Regions training at least one community agency | 100% |
| % Regions training at a parent group | 60% |
| % Regions training other DHEC staff | 60% |
| Avg. # Training sessions/Region | 7 |
| Avg. # Participants/Session | 9.6 |

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Figure 1: Regional Network Capacity Building Tree Diagram

<table>
<thead>
<tr>
<th>REGIONAL NETWORK CAPACITY BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIOHQI Identified</td>
</tr>
<tr>
<td>37.2%</td>
</tr>
<tr>
<td>Contacted</td>
</tr>
<tr>
<td>23.9%</td>
</tr>
<tr>
<td>Contacted bc PIOHQI</td>
</tr>
<tr>
<td>9.6%</td>
</tr>
<tr>
<td>Not Contacted</td>
</tr>
<tr>
<td>29.3%</td>
</tr>
<tr>
<td>Pre-PIOHQI Organizations</td>
</tr>
</tbody>
</table>

Figure 2: Number of website hits from April 2018-April 2019
Figure 3: State Network Diagram by Organizational Type

Figure 4: Regional Network Diagram by Organizational Type
Figure 5: Number of Medicaid Children receiving fluoride varnish in non-dental setting
Other Materials: Training Evaluations for Learning Lab Sites

In the February 2018, staff and personnel at the Winnsboro and Hopkins offices of Eau Claire were oral health messaging to pregnant women and women with infants. Table 1 reports the results of the pre- and post-assessments of the Winnsboro training activities. Table 2 provides the results of the Hopkins training activities.

1. Eau Claire – Winnsboro

The Winnsboro training activity took place on February 5, 2018.

Table 1: Eau Claire, Winnsboro Training Results

<table>
<thead>
<tr>
<th>On a scale from 1-5</th>
<th>Pre-Assessment (Mean, SE)</th>
<th>Post-Assessment (Mean, SE)</th>
<th>Change (Paired) (n=7) (Diff., SE)</th>
<th>Item Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How familiar are you with the oral health messages that should be shared with parents of infants ages 0-3?</td>
<td>3.29 (0.42)</td>
<td>4.29 (0.18)</td>
<td>1.00* (0.38)</td>
</tr>
<tr>
<td>2</td>
<td>How confident are you in your ability to integrate oral health into your work with pregnant women and families?</td>
<td>3.29 (0.47)</td>
<td>4.43 (0.20)</td>
<td>1.14* (0.51)</td>
</tr>
<tr>
<td>3</td>
<td>How capable do you feel in helping the people you work with improve their oral health and navigate care?</td>
<td>4.14 (0.26)</td>
<td>4.43 (0.20)</td>
<td>0.29 (0.29)</td>
</tr>
<tr>
<td>4</td>
<td>How familiar are you with the process/process map related to the project between DHEC’s division of oral health and Eau Claire?</td>
<td>2.57 (0.61)</td>
<td>4.29 (0.42)</td>
<td>1.71** (0.52)</td>
</tr>
<tr>
<td>5</td>
<td>How would you rate your understanding of the project as it relates to your work?</td>
<td>3.5 (0.62)</td>
<td>4.33 (0.33)</td>
<td>0.83 (0.70)</td>
</tr>
<tr>
<td>6</td>
<td>How familiar are you with the requirements of the PIOHQI grant?</td>
<td>1.29 (0.18)</td>
<td>4.0 (0.38)</td>
<td>2.71 (0.36)**</td>
</tr>
<tr>
<td>7</td>
<td>How would you rate the oral health of the clients you serve?</td>
<td>3.25 (0.63)</td>
<td>3.0 (0.82)</td>
<td>-0.25 (0.25)</td>
</tr>
<tr>
<td>8</td>
<td>How familiar do you think your clients are about achieving and maintaining oral health?</td>
<td>3.43 (0.53)</td>
<td>3.43 (0.57)</td>
<td>0 (0.22)</td>
</tr>
<tr>
<td>9</td>
<td>How familiar do you think your clients are about finding a dentist, making a dental appointment, and/or keeping dental appt?</td>
<td>3.0 (0.58)</td>
<td>3.71 (0.56)</td>
<td>0.71 (0.29)*</td>
</tr>
</tbody>
</table>

* p-value <0.05, ** p-value <0.01, *** p-value <0.001

Eleven Eau Claire, Winnsboro employees were trained. We received 9 pre-training surveys and 7 post-training assessments from participants for a response rate of 82% and 63% respectively. Results from the training sessions are based on paired sample t-tests using data from the 7 participants who completed both the pre- and post-training assessment form, or 63% of the participants. The training session led to significant and noticeable increases in the participants’ familiarity with the requirements of the PIOHQI grant and the process mapping process. The training session also led to significant increases in the participants’ familiarity with the oral health messages to be shared with parents of infants 0-3 years old and (ii) confidence in their ability to integrate oral health into their work with pregnant women and families. The training session also resulted in a modest increase in the participants’ thoughts about their clients’ familiarity with finding a dentist, making or keeping a dental appointment. Participants identified
transportation and costs for medical or dental care as the main barriers to individuals accessing oral health care.

2. Eau Claire – Hopkins

The Hopkins training activity took place on February 25, 2018.

Table 2: Eau Claire, Hopkins Training Results

<table>
<thead>
<tr>
<th>On a scale from 1-5 (5=most familiar), ...</th>
<th>Pre-Assessment (Mean, SE)</th>
<th>Post-Assessment (Mean, SE)</th>
<th>Change (Paired) (n=6) (Diff, SE)</th>
<th>Item Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 How familiar are you with the oral health messages that should be shared with parents of infants ages 0-3?</td>
<td>2.67 (0.61)</td>
<td>3.33 (0.49)</td>
<td>0.67 (0.56)</td>
<td>100%</td>
</tr>
<tr>
<td>2 How familiar are you with the oral health messages that should be shared with pregnant women?</td>
<td>4.17 (0.65)</td>
<td>4.5 (0.22)</td>
<td>0.33 (0.56)</td>
<td>100%</td>
</tr>
<tr>
<td>3 How confident are you in your ability to integrate oral health into your work with pregnant women and families?</td>
<td>4.33 (0.33)</td>
<td>4.67 (0.21)</td>
<td>0.34 (0.33)</td>
<td>100%</td>
</tr>
<tr>
<td>4 How capable do you feel in helping the people you work with improve their oral health and navigate care?</td>
<td>4.50 (0.22)</td>
<td>4.50 (0.22)</td>
<td>0.0 (0.26)</td>
<td>100%</td>
</tr>
<tr>
<td>5 How familiar are you with the process/process map related to the project between DHEC's division of oral health and Eau Claire?</td>
<td>3.20 (0.73)</td>
<td>4.60 (0.24)</td>
<td>1.40^ (0.68)</td>
<td>83.3%</td>
</tr>
<tr>
<td>6 How familiar are you with the requirements of the PIOHQI grant?</td>
<td>3.2 (0.73)</td>
<td>4.60 (0.24)</td>
<td>1.40^ (0.68)</td>
<td>83.3%</td>
</tr>
<tr>
<td>7 How would your rate the oral health of the clients you serve (n=4)?</td>
<td>2.50 (0.29)</td>
<td>2.75 (0.25)</td>
<td>0.25 (0.25)</td>
<td>66.7%</td>
</tr>
<tr>
<td>8 How familiar do you think your clients are about achieving and maintaining oral health?</td>
<td>2.83 (0.54)</td>
<td>3.00 (0.52)</td>
<td>0.17 (0.65)</td>
<td>100%</td>
</tr>
<tr>
<td>9 How familiar do you think your clients are about finding a dentist, making a dental appointment, and/or keeping dental appt?</td>
<td>2.67 (0.21)</td>
<td>3.50 (0.50)</td>
<td>0.83 (0.70)</td>
<td>100%</td>
</tr>
</tbody>
</table>

^ p < 0.10

Seven employees and personnel at the Eau Claire, Hopkins’ office were trained. We received 7 pre-training surveys and 6 post-training assessments from participants for a response rate of 100% and 86% respectively. Results are based on paired sample t-tests using data from the six participants who completed both the pre-and post-training assessments, or 86% of the participants. There was a slight modification in the questionnaire between the Winnsboro and Hopkins training activities. The training sessions showed increases in the average values of the variables but these did not approach statistical significance at 95% confidence. However, the training sessions did show an increase in participants’ familiarity with process mapping and the PIOHQI grant at 90% confidence (p<0.10). Participants identified transportation, costs for medical or dental care, including insurance, and access to a dental provider as the main barriers to individuals accessing oral health care.

3. Palmetto Healthy Start Training Session Assessment

Pre-Assessment Date: September 8, 2017
**Post-Assessment Date: September 15, 2017**

**Table 3: Palmetto Healthy Start**

<table>
<thead>
<tr>
<th></th>
<th>On a scale from 1-5 (5=most familiar), ...</th>
<th>Pre-Assessment (n=9)</th>
<th>Post-Assessment (n=15)</th>
<th>Difference (Unmatched)</th>
<th>Change (Matched) (n=8-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>how would you rate the oral health of the clients you serve?</td>
<td>3.33 (0.42)</td>
<td>3.36 (0.31)</td>
<td>0.03</td>
<td>0.37</td>
</tr>
<tr>
<td>2</td>
<td>how capable do you feel in helping the people you work with improve their oral health and navigate care?</td>
<td>3.33 (0.42)</td>
<td>3.53 (0.13)</td>
<td>0.20</td>
<td>0.56*</td>
</tr>
<tr>
<td>3</td>
<td>how familiar are you with the oral health messages that should be shared with parents of infants ages 0-3?</td>
<td>4.0 (0.37)</td>
<td>4.64 (0.13)</td>
<td>0.64</td>
<td>0.63**</td>
</tr>
<tr>
<td>4</td>
<td>how familiar are you with the oral health messages that should be shared with pregnant women?</td>
<td>4.17 (0.31)</td>
<td>4.67 (0.13)</td>
<td>0.50</td>
<td>0.25^</td>
</tr>
<tr>
<td>5</td>
<td>how confident are you in your ability to integrate oral health into your work with pregnant women and families?</td>
<td>4.17 (0.31)</td>
<td>4.86 (0.10)</td>
<td>0.69</td>
<td>1**</td>
</tr>
<tr>
<td>6</td>
<td>how familiar are you with quality improvement methods and tools?</td>
<td>2.67 (0.61)</td>
<td>4.27 (0.21)</td>
<td>1.60</td>
<td>1.33**</td>
</tr>
<tr>
<td>7</td>
<td>how familiar do you think your clients are about achieving and maintaining oral health?</td>
<td>3.17 (0.48)</td>
<td>3.86 (0.27)</td>
<td>0.69</td>
<td>1.14**</td>
</tr>
<tr>
<td>8</td>
<td>how familiar do you think your clients are about finding a dentist, making a dental appointment, and/or keeping a dental appointment?</td>
<td>3.17 (0.31)</td>
<td>3.64 (0.25)</td>
<td>0.47</td>
<td>0.5*</td>
</tr>
</tbody>
</table>

^p-value < 0.10; **p < 0.01; *p < 0.05
Learning Lab Process Maps

Figure: Test Map for Eau Claire Winnsboro Pediatric Office

Figure: Process Map for Eau Claire Hopkins Pediatric Office